

## REMARKS

Applicants respectfully request entry of the foregoing and reconsideration of the subject matter identified in caption, as amended, pursuant to and consistent with 37 C.F.R. § 1.112, and in light of the remarks which follow.

Applicants thank the Examiner for acknowledging Applicants' claim for foreign priority under 35 U.S.C. §119 and for indicating that all certified copies of the priority documents have been received.

Claims 17-32 are pending in the application.

By the above amendments, Applicants amended Claims 17, 24, 29, 30 and 32 to address § 112 issues and/or to place the application into a more conventional U.S. Patent format. A claim that has been amended in a manner that does not narrow the claim's scope should be accorded its full range of equivalents.

Turning now to the Official Action, Claims 17, 24, 29, 30 and 32 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. For at least the reasons that follow, withdrawal of the rejection is in order.

With respect to the rejection of Claims 17, 29 and 32 for not including conventional Markush group language, Applicants have amended these claims, where appropriate, to insert more conventional US-style claim language.

With respect to the rejection of Claim 24 for its definition of variable "A," Applicants have amended the claim by replacing "and" with --or--.

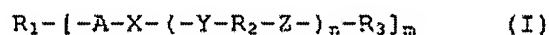
Finally, with respect to the rejection of Claim 30, Applicants have replaced "ororganophosphorous" with --or organophosphorous--.

For at least these reasons, Applicants respectfully request reconsideration and withdrawal of the § 112, second paragraph, rejection of Claims 17, 24, 29, 30 and 32.

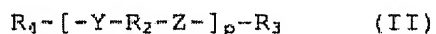
Claims 17-32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Cucinella (U.S. Patent No. 6,160,080) in view of Asano (U.S. Patent Application Publication No. 2001/0007888). For at least the reasons that follow, withdrawal of the rejection is in order.

Claim 17 defines a fire-resistant composition comprising at least:

a) a star polyamide-based polyamide matrix comprising at least macromolecular chains of formula (I):



and, optionally, macromolecular chains of formula (II):



wherein:

Y is the radical:  $\begin{array}{c} \text{---N---} \\ | \\ R_5 \end{array}$  when X and Z represent the radical:  $\begin{array}{c} \text{---C---} \\ || \\ O \end{array}$  ;

Y is the radical:  $\begin{array}{c} \text{---C---} \\ || \\ O \end{array}$  when X and Z represent the radical:  $\begin{array}{c} \text{---N---} \\ | \\ R_5 \end{array}$  ;

A is a covalent bond or an aliphatic hydrocarbon-based radical optionally having hetero atoms and having from 1 to 20 carbon atoms;

R<sub>1</sub> is a linear or cyclic, aromatic or aliphatic hydrocarbon-based radical having at least 2 carbon atoms, and optionally having hetero atoms;

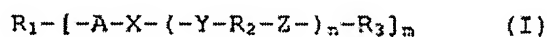
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For at least the reasons, Applicants respectfully request reconsideration and withdrawal of the § 112, second paragraph, rejection of Claims 17, 24, 29, 30 and 32.

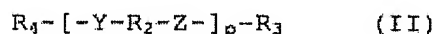
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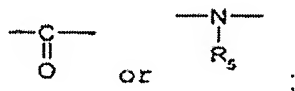
Y is the radical:  $\begin{array}{c} \text{---C---} \\ || \\ O \end{array}$  when X and Z represent the radical:  $\begin{array}{c} \text{---N---} \\ | \\ R_5 \end{array}$  ;

A is a covalent bond or an aliphatic hydrocarbon-based radical optionally having hetero atoms and having from 1 to 20 carbon atoms;

R<sub>1</sub> is a linear or cyclic, aromatic or aliphatic hydrocarbon-based radical having at least 2 carbon atoms, and optionally having hetero atoms;

R<sub>2</sub> is an aliphatic or aromatic, branched or unbranched hydrocarbon-based radical having from 2 to 20 carbon atoms;

R<sub>3</sub> and R<sub>4</sub> are independently selected from the group consisting of hydrogen, an -OH radical and/or a hydrocarbon-based radical having at least one group:



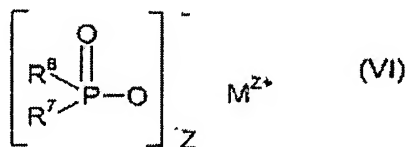
R<sub>5</sub> represents hydrogen or a hydrocarbon-based radical having from 1 to 6 carbon atoms;

m represents an integer between 3 and 8;

n represents an integer between 50 and 200; and

p represents an integer between 50 and 200; and

b) a fire-resistant composition comprising at least; a compound (F1) of formula (VI):



wherein:

R<sub>6</sub> and R<sub>7</sub> are identical or different and represent a linear or branched alkyl chain having from 1 to 6 carbon atoms and/or an aryl radical;

M is selected from the group consisting of a calcium, magnesium, aluminum and/or zinc ion;

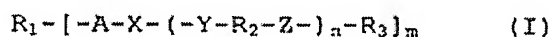
Z represents 2 or 3; and

a compound (F2), which is a product of reaction between phosphoric acid and melamine and/or a product of reaction between phosphoric acid and a condensed melamine product. (Emphasis added.)

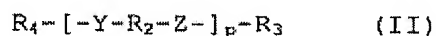
Claim 31 defines a process for manufacturing a fire-resistant composition comprising the steps of:

1) mixing together:

a) a star polyamide-based polyamide matrix comprising at least macromolecular chains of formula (I):



and optionally macromolecular chains of formula (II):



wherein:

Y is the radical:  $\begin{array}{c} \text{---N---} \\ | \\ R_5 \end{array}$  when X and Z represent the radical:  $\begin{array}{c} \text{---C---} \\ || \\ O \end{array}$  ;

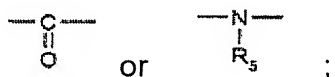
Y is the radical:  $\begin{array}{c} \text{---C---} \\ || \\ O \end{array}$  when X and Z represent the radical:  $\begin{array}{c} \text{---N---} \\ | \\ R_5 \end{array}$  ;

A is a covalent bond or an aliphatic hydrocarbon-based radical optionally having hetero atoms and having from 1 to 20 carbon atoms;

R<sub>1</sub> is a linear or cyclic, aromatic or aliphatic hydrocarbon-based radical having at least 2 carbon atoms and optionally having hetero atoms;

R<sub>2</sub> is an aliphatic or aromatic, branched or unbranched hydrocarbon-based radical having from 2 to 20 carbon atoms;

R<sub>3</sub> and R<sub>4</sub> independently represent hydrogen, an -OH radical and/or a hydrocarbon-based radical having at least one group:



R<sub>5</sub> represents hydrogen or a hydrocarbon-based radical having from 1 to 6 carbon atoms;

m represents an integer between 3 and 8;

n represents an integer between 50 and 200;

p represents an integer between 50 and 200; and

b) a fire-resistant composition comprising at least:

a compound (F1) of formula (VI):

wherein:

R<sub>6</sub> and R<sub>7</sub> are identical or different and represent a linear or branched alkyl chain having from 1 to 6 carbon atoms and/or an aryl radical;

M represents a calcium, magnesium, aluminum and/or zinc ion;

Z represents 2 or 3; and

a compound (F2), which is a product of reaction between phosphoric acid and melamine and/or a product of reaction between phosphoric acid and a condensed melamine product; and

2) recovering the fire-resistant composition obtained in step 1).

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all of the claimed features. (See, *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974).) In addition, "all words in a claim must be considered in judging the patentability of that claim against

the prior art." (See, *In re Wilson*, 424 F.2d 1382, 1385; 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970).) (See, also M.P.E.P. § 2143.03).

Cucinella relates to a polyamide comprising macromolecular chains with a different chemical structure and to a process for its manufacture, as well as to compositions containing it. (See Cucinella at column 1, lines 5-9.)

Asano relates to flame retardant resin compositions excellent in impact resistance, heat resistance, dimensional stability, and flame retardance of the resulting molded articles, a process for producing the composition and molded articles obtained from the composition. (See Asano at page 1, paragraph [0001].)

In particular, Cucinella discloses a specific star polyamide matrix composition, which may comprise several possible additives. Nowhere does Cucinella disclose or fairly suggest modifying the star polyamide matrix to include any specific flame retardant, let alone the specific flame retardant defined in the independent claims of the instant application.

The secondary reference, Asano does not overcome the deficiencies of Cucinella. That is, Asano discloses a flame retardant composition comprising a polyester or polyamide resin and non-halogen organic flame retardant additives as well as rubbers, and polyphenylene resins. Although a variety of flame retardant additives may be used, the experimental section and specific Examples in Asano focus on the use of melamine cyanurate and calcium phosphinate for nylon 6 resins. Nowhere does the reference disclose or fairly suggest selecting the claimed flame retardant and combining that retardant with a specific polymer composition disclosed in Cucinella.

In contrast, the independent claims of the instant application specifically define compositions and/or methods of making such compositions which employ a fire-resistant composition comprising at least a compound (F1) of Formula (VI) and a compound (F2), which is a product of reaction between phosphoric acid and melamine and/or a product of reaction between phosphoric acid and a condensed melamine product.

Accordingly, Applicants submit that the Official Action has not established a *prima facie* case of obviousness over the asserted combination of references because neither reference, alone or combination, discloses or fairly suggests each feature in the combination of features defined in independent claims 17 and 31. In addition, Applicants submit that the asserted combination of references does not establish a *prima facie* case of obviousness because it does not reflect a proper consideration of "all words" in the claims including "fire-resistant composition comprising at least: a compound (F1) of Formula (VI) ...; and a compound (F2), which is a product of reaction between phosphoric acid and melamine and/or a product of reaction between phosphoric acid and a condensed melamine product."

Furthermore, there is no motivation in the references, alone or in combination, to modify the teachings of the references to arrive at the claimed composition and method defined by independent claims 17 and 31, which define a specific combination of features including the defined fire-resistant composition comprising at least a compound (F1) and a compound (F2). Applicants submit that the Official Action provides no reasons *why* one of ordinary skill in the art would have been led to modify the prior art references or combine their teachings to arrive at the claimed composition or method. There is no suggestion or inference in the prior art as a



knowledge generally available to one of ordinary skill in the art to make the asserted combination. In particular, one would not have recognized from the cited references, alone or in combination, that one could use the specific fire-resistant composition claimed in combination with the claimed star polyamide-based polyamide matrix to achieve and maintain suitable fire resistance and mechanical properties. The requisite motivation must stem from some teaching, suggestion or inference in the prior art as a whole or from the knowledge generally available to one of ordinary skill in the art, not from Applicants' disclosure. (See, *Ex Parte Nesbit*, 25 U.S.P.Q. 2d 1817, 1819 (B.P.A.I. 1992); and *In re Oetiker*, 24 U.S.P.Q. 2d 1443, 1446 (Fed. Cir. 1992).) The mere fact that the prior art can be modified does not make such a modification obvious unless the prior art or some other evidence specifically suggests the desirability of the modification. (See, *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984).)

Here, no such factors or motivation for combining Cucinella and Asano exist. In particular, it appears to Applicants that one of ordinary skill in the art would not have been led to modify the star polymer of Cucinella with a specific fire-resistant composition comprising at least compound (F1) and (F2), as claimed, based on the disclosures of the cited references. There simply is no disclosure or suggestion of this in the cited references or elsewhere in the record.

In view of the varying teachings of the cited references and the failure of the references (or any other evidence) to provide any suggestion that one should, or even could, combine specific features of the references to obtain the claimed composition and method, Applicants submit that the Official Action has not demonstrated that one of ordinary skill in the art would have combined the cited

references. Thus, Applicants submit that there is no basis absent the impermissible use of hindsight based on Applicants' disclosure, for combining the references, as suggested in the Official Action. The only motivation for making the claimed modifications comes from the present specification, which teaches the desirability of the claimed combination of features to obtain compositions exhibiting and maintaining good fire resistance and mechanical properties. However, it is well-established that the motivation for combining references "cannot come from Applicants' invention itself." (See *In re Oetiker*, 977, F.2d 1443, 24 U.S.P.Q. 2d 1443, 1446 (Fed. Cir. 1992).) That is, the motivation cannot be a product of hindsight reconstruction based on Applicants' own disclosure.

The Official Action appears to have made such a hindsight reconstruction. because it asserts that the claimed subject matter would have been obvious based on a hindsight selection of claimed features. Such a combination is improper because the references, viewed by themselves and not in retrospect, do not suggest the combination asserted by the Official Action. (See *In re Schaffer*, 229 F.2d 476, 108 U.S.P.Q. 326 (C.C.P.A. 1956); and *In re Stoll*, 523 F.2d 1392, 187 U.S.P.Q. 481 (C.C.P.A. 1975).) Here, neither the references nor any extrinsic evidence provide any motivation for combining different features of the references to obtain the presently claimed composition and method. The only motivation for ignoring the varying teachings of the references is derived from the disclosure of the present application, which is clearly improper.

Applicants also ask the Examiner to consider the fact that the Examples of the instant application provide comparative data from tests conducted using a star polyamide matrix in (Table 1) in comparison with a classic 6 or 66 polyamide. The

results show that the claimed composition permits one to significantly decrease the time of combustion of the tested compositions while reducing weight loss TGA, and enhancing desired mechanical properties. Applicants respectfully submit that these results would not have been expected based on the disclosures of Cucinella and Asano, alone or in combination. There simply is no indication in either reference that the specifically claimed combination of features would result in good fire resistance and mechanical properties.

The Federal Circuit has established that evidence arising out of the so-called secondary considerations must always, when present, be considered en route to a determination of obviousness. Indeed, evidence of secondary considerations can be the most probative and cogent evidence on the record. It can establish that an invention appearing to have been obvious in light of the prior art was not. (See *Stratoflex Inc. v. Aeroquip Corp*, 218 U.S.P.Q. 871, 879 (Fed. Cir 1983); and *Joy Technologies v. Manbeck*, 17 U.S.P.Q.2d 1257 (D.D.C. 1990).) In this case, there is clearly no appreciation in either of the cited references, alone or combination, of the good fire resistance and mechanical properties obtained by the claimed combination of features. In particular, the cited references, even in combination, fail to disclose or suggest that one could make the specific combination claimed to arrive at a composition and/or method for making a composition that would exhibit these desirable properties.

Accordingly, even if the Official Action had established a *prima facie* showing of obviousness, which Applicants submit that it has not, the unexpected results achieved by the claimed combination of features would rebut such a showing.

For at least these reasons, Claims 17 and 31 are patentable over the combination of Cucinella and Asano. The remaining claims (Claims 2-30 and 32) depend, directly or indirectly, from Claim 17 and are, therefore, also patentable for at least the reasons that Claims 17 and 31 are patentable. Reconsideration and withdrawal of the § 103 rejection of Claims 17-32 are respectfully requested.

From the foregoing, Applicants earnestly solicit further and favorable action in the form of a Notice of Allowance.

If there are any questions concerning this paper or the application in general, Applicants invite the Examiner to telephone the undersigned at the Examiner's earliest convenience.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

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